



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,808	09/30/2005	Xiao Long Lu	FP11137	6762

7590 09/04/2007
Leong C Lei
1867 Ygnacio Valley Road
PMB#1008
Walnut Creek, CA 94598

EXAMINER

ANDERSON, DENISE R

ART UNIT	PAPER NUMBER
----------	--------------

1709

MAIL DATE	DELIVERY MODE
-----------	---------------

09/04/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/551,808

Applicant(s)

LU, XIAO LONG

Examiner

Denise R. Anderson

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☒ Claim(s) 1,2,4 and 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Claim Objections

1. Claims 1, 2, 4, and 6 are objected to because of the following informalities:

Claim 1:

- a. Part of lines 4 and 5 should read "with a pump, a raw water flow rate controller and a check valve for adding chemical reagent; the raw water flow rate controller" and so on.
- b. Part of line 7 should read "membrane assembly; the check valve".

Claim 2:

- a. Part of line 2 should read "a double pipeline".
- b. Part of line 4 should read "the two pipelines are opened".

Claim 4:

- a. There is no antecedent basis for "the two branch" in line 3. Based on the specification, the examiner will assume "the two branch" is located between valves 4 and 5 in Figure 1.

Claim 6:

- a. In line 3, "The" should read "the".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1709

3. Claims 1, 2, 5, and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding claims 1, 5, and 6, the phrase "etc." renders each claim indefinite because each claim includes elements not actually disclosed (those encompassed by "etc."), thereby rendering the scope of the claim unascertainable. See MPEP § 2173.05(d).

5. Regarding claim 2, applicant is combining apparatus limitations with method limitations. Because claim 2 depends on apparatus claim 1, the examiner interpreted claim 2 as an apparatus claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu (US Pat. Pub. No. 2003/0052068 A1, Mar. 20, 2003). The applicant is the same Lu that was the applicant of the cited patent publication. An element-by-element matching appears below between each claim limitation and the prior art. The claims are in italics and the prior art and examiner's comments are in normal font.

Claim 1. A separating system of the hollow fiber membrane (Lu, Abstract, first sentence) includes a membrane assembly (Lu, Figure 1, reference part 21), a cycling tank (Lu, Figure 1, reference part 23) and pipelines, wherein the pipeline (40) (Lu, Figure 1, the pipeline runs through valve 6, pump 22, valve 1, valve 11, and then on into the membrane assembly 23) for inlet of liquid is connected between the cycling trough (28) (Lu, Figure 1, reference part 23) and the membrane assembly (21) (Lu, Figure 1, reference part 21) to supply raw water to the membrane assembly; the pipeline (40) for inlet of liquid is equipped with pump (29) (Lu, Figure 1, reference part 22), the raw water flow rate controller (Lu, Figure 1, reference parts 11 and 1) and the check valve (Lu, Figure 1, reference part 18) for adding chemical reagent etc; the raw water flow rate controller is used to control a small amount of raw water to flow into the membrane assembly during the first cleaning status of cleaning the membrane assembly; The check valve for adding the chemical reagent is used to add the chemical reagent into the raw water during the first cleaning status of cleaning the membrane assembly.

The phrase "etc." renders claim 1 indefinite because claim 1 includes elements not actually disclosed (those encompassed by "etc."), thereby rendering the scope of the claim unascertainable. The examiner will assume the phrase "etc." has been deleted.

Lu discloses all claim 1 limitations except that the check valve to add chemical reagent appears on the resultant water line (the permeate line) instead of the raw water line (the feed line). Lu further teaches using the check valve on the resultant water line to add a chemical reagent directly to the cycling trough (cycling tank) when the membranes are chemically cleaned. Lu, ¶ 38, lines 5-9. The chemical reagent is then fed from the cycling trough to the membranes. In essence, Lu teaches adding chemical reagent before the cycling trough and applicant teaches adding chemical reagent after the cycling trough. In either case, the chemical reagent ends up at the membranes to clean the membranes during a cleaning cycle. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have added chemical reagent after the cycling trough, rather than before, since applicant has not disclosed that adding the chemical reagent after the cycling trough solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the chemical reagent added before the cycling trough:

Claim 2. The separating system of the hollow fiber membrane as set forth in claim 1, wherein the raw water flow rate controller is the double pipeline (44) for

inlet of liquid, which include the first pipeline for inlet of liquid and the second pipeline for inlet of liquid; the double pipeline (44) for inlet of liquid is operated as below: the two pipelines is opened during the operating status of the system, but in the first status, close the first pipeline for inlet of liquid thereby to decrease the flow rate of entering to the 5%-50% of the rated flow rate.

Applicant is combining apparatus limitations with method limitations.

Because this claim depends on an apparatus claim, the examiner interpreted the claim as an apparatus claim. Hence, the recited operating instructions do not further limit the apparatus being claimed.

Lu discloses or suggests all claim 1 limitations and, in Figure 1, further teaches the double pipeline flow rate controller after the backwash pump (applicant's pump 24 in applicant's Figure 1). Applicant's double pipeline flow rate controller is placed after the raw water feed pump 29 (Lu's pump 22 in Lu's Figure 1). In either case, a double pipeline flow controller is placed after a pump to solve the problem of using the same equipment to deliver a high flow rate during some parts of the operating cycle and a low flow rate during others. Lu, ¶ 21 and Figure 1. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have placed a double pipeline flow rate controller after the raw water feed pump as taught by Lu, since Lu states at ¶ 21 that such a modification would allow the same equipment to be used to deliver a high flow rate in some parts of the operating cycle and a low flow rate in others.

Claim 4. The separating system of the hollow fiber membrane as set forth in claim 1 or 2, wherein the backwash pipeline (43) (Lu, Figure 1, the backwash pipeline runs after tank 25, through valve 7 and into pump 24) is connected on the tail end of the pipeline for outlet of liquid (Lu, Figure 1, the pipeline for the outlet of the liquid runs from tank 25 through valve 7 and out valve 9) before it is connected to the two branch (Lu, Figure 1, the two branch is located between valves 4 and 5), the backwash pipeline (43) is connected to the resultant water tank (25) (Lu, Figure 1, reference part 25) to supply the backwash solution to the membrane assembly during the second cleaning status of cleaning the membrane assembly.

There is no antecedent basis for "the two branch" in line 3. Based on the specification, the examiner will assume "the two branch" is located between valves 4 and 5 in Figure 1.

Lu discloses or suggests all claim 1 limitations and all claim 2 limitations. The only difference between Lu's apparatus and applicant's apparatus is that valve 7 has moved from directly after the tank (Lu) to directly before the pump (applicant). This relocation does not affect the backwash solution being delivered "to the membrane assembly during the second cleaning status of cleaning the membrane assembly." It would have been obvious to one having ordinary skill in the art at the time the invention was made to move valve 7 from directly before the pump to directly after the tank, since it has been held that

rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu (US Pat. Pub. No. 003/0052068 A1, Mar. 20, 2003) as applied to claim 1 above, and further in view of Al-Samadi (US Patent No. 6,416,668 B1, Jul. 9, 2002). An element-by-element matching appears below of each claim to the prior art. The claims are in italics and the prior art and examiner's comments are in normal font.

Claim 5. The separating system of the hollow fiber membrane as set forth in claim 1, wherein there are two valves for adding the chemical reagent which are used to add the oxidant (Lu, ¶ 31) and/or the scale-resisting reagent simultaneously and/or separately according to the quality of the water; the oxidant maybe the sodium hypochlorite, ozone, chlorine dioxide (Lu, ¶ 31) etc; and the scale-resisting reagent maybe the scale-resisting reagent product and hydrochloric acid (Lu, Claim 9) etc.

The phrase "etc." renders claim 5 indefinite because claim 5 includes elements not actually disclosed (those encompassed by "etc."), thereby rendering the scope of each claim unascertainable. The examiner will assume the phrase "etc." has been deleted.

Lu discloses or suggests all claim 1 limitations except for (1) the check valve to add chemical reagent being duplicated and (2) the chemical reagent being a "scale-resisting reagent." These two limitations will be discussed in turn.

With regards to claiming an additional check valve – it would have been obvious to one having ordinary skill in the art at the time the invention was made to have duplicated the check valve to add chemical reagent, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

With regards using the valve to add a “scale-resisting reagent,” Al-Samadi discloses pre-treatments for water to be purified by micro-filtration, ultra-filtration, nano-filtration, or reverse osmosis membranes. The pretreatments are done to ensure against “irreversible chemical fouling” of the membranes. Al-Samadi, Abstract, lines 4-7. Al-Samadi further teaches a scale-resisting reagent (scale inhibitor) being added to the water prior to the membranes. Al-Samadi, Figure 3, reference number 22. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a Lu valve to add a scale-resisting reagent as taught by Al-Samadi, since Al-Samadi states in the last sentence of the Abstract that such a modification would help ensure “against irreversible chemical fouling” of the membranes.

Claim 6. The separating system of the hollow fiber membrane as set forth in claim 1, wherein the oxidant (Lu, ¶ 31) or the scale-resisting reagent is added according to the quality of the water; the oxidant may be the sodium hypochlorite, ozone, chlorine dioxide (Lu, ¶ 31) etc; and The scale-resisting reagent may be the scale-resisting reagent product and hydrochloric acid etc.

The phrase "etc." renders claim 6 indefinite because claim 6 includes elements not actually disclosed (those encompassed by "etc."), thereby rendering the scope of the claim unascertainable. The examiner will assume the phrase "etc." has been deleted.

Lu discloses or suggests all claim 1 limitations except for the chemical reagent being a "scale-resisting reagent." This limitation was discussed in claim 5 and the same reasoning applies here, but will not be repeated. In summary, Lu in view of Al-Samadi discloses all claim 6 limitations.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lu (US Pat. Pub. No. 003/0052068 A1, Mar. 20, 2003) as applied to claim 1 above, and further in view of California Energy Commission (a report issued by the California Energy Commission entitled "Variable-Frequency Drive," <http://www.energy.ca.gov/process/pubs/vfds.pdf>, Jan. 25, 2001). Claim 3 is shown below in italics with the prior art and examiner's comments in normal font.

Claim 3. The separating system of the hollow fiber membrane as set forth in claim 1, wherein the raw water flow rate controller is the frequency controller which is used to control the pump to decrease the flow rate of entering to the 5%-50% of the rated flow rate.

Lu discloses or suggests all claim limitations except for the variable-frequency drive used on the pump to control the raw water flow rate. The claim recites that flow rates are decreased from 5% to 50% of the initial flow rate. The California

Energy Commission teaches, "Variable-frequency drives enable pumps to accommodate fluctuating demand, running pumps at lower speeds and drawing less energy while still meeting pumping needs. Figure 1 illustrates the reduced energy consumption of variable-frequency drives over valve control systems."

California Energy Commission, Section entitled "Use in the Water / Wastewater Treatment Process," ¶ 2, last two sentences; Figure 1 in the same section).

Figure 1 also illustrates that flow rates are decreased from 5% to 50% of the initial flow rate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have controlled the raw water flow rate with a variable-frequency drive on the pump as taught by the California Energy Commission, since the California Energy Commission states at the section entitled "Use in the Water / Wastewater Treatment Process," ¶ 2, last two sentences, that such a modification would accommodate fluctuating flow rate demand and reduce energy consumption relative to valve control systems.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise R. Anderson whose telephone number is 571-270-3166. The examiner can normally be reached on Monday through Thursday, 8:00 am to 6:00 pm.

Art Unit: 1709

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRA


WALTER D. GRIFFIN
SUPERVISORY PATENT EXAMINER